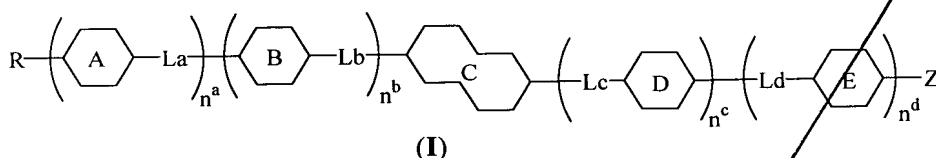
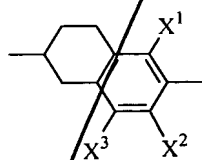


## CLAIMS

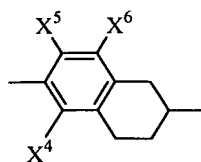
1. A tetrahydronaphthalene derivative represented by a general formula (I)



- 5 (wherein, R represents a saturated or unsaturated alkyl group or alkoxyl group of 1 to 20 carbon atoms which may incorporate a branched chain and may be substituted with 1 to 7 fluorine atoms or alkoxyl groups of 1 to 7 carbon atoms; linkage groups La, Lb, Lc and Ld each represent independently a single bond,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}=\text{CH}-$ ,  $-\text{CH}(\text{CH}_3)\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}(\text{CH}_3)-$ ,  $-\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)-$ ,  $-\text{CF}_2\text{CF}_2-$ ,  $-\text{CF}=\text{CF}-$ ,  $-\text{CH}_2\text{O}-$ ,  $-\text{OCH}_2-$ ,  $-\text{OCH}(\text{CH}_3)-$ ,  $-\text{CH}(\text{CH}_3)\text{O}-$ ,  $-\text{C}\equiv\text{C}-$ ,  $-\text{CF}_2\text{O}-$ ,  $-\text{OCF}_2-$ ,  $-\text{COO}-$ ,  $-\text{OCO}-$ ,  $-\text{COS}-$  or  $-\text{SCO}-$ ; Z represents a
- 10 fluorine atom, chlorine atom, cyano group, cyanato group, trifluoromethoxy group or a difluoromethoxy group; ring A, ring B and ring D each represent independently a trans-1,4-cyclohexylene group, a trans-decahydronaphthalene-2,6-diyl group, a trans-1,3-dioxane-2,4-diyl group, or a 1,4-phenylene group which may be substituted with one or two fluorine
- 15 atoms, a pyridine-2,5-diyl group, a pyrimidine-2,5-diyl group, a pyrazine-2,5-diyl group, a pyridazine-3,6-diyl group, and a naphthalene-2,6-diyl group which may be substituted with one or two fluorine atoms; ring E represents independently a 1,4-phenylene group which may be substituted with one or two fluorine atoms, and a naphthalene-2,6-diyl group which may be substituted with one or two fluorine atoms, ring C represents either one of a general
- 20 formula (IIa) and a general formula (IIb)



(IIa)



(IIb)

(wherein,  $X^1$ ,  $X^2$ ,  $X^3$ ,  $X^4$ ,  $X^5$  and  $X^6$  each represent a hydrogen atom or a fluorine atom); and  $n^a$ ,  $n^b$ ,  $n^c$  and  $n^d$  each represent independently either 0 or 1;

although, in a case in which  $n^c = 1$  and  $n^d = 0$ , ring D represents a 1,4-phenylene group which may be substituted with one or two fluorine atoms and/or a naphthalene-2,6-diyl group which may be substituted with one or two fluorine atoms,

in a case in which Z is a cyano group, R is an unsubstituted and saturated alkyl group or alkoxyl group,  $n^a = n^c = n^d = 0$  and  $n^b = 1$ , or  $n^b = n^c = n^d = 0$  and  $n^a = 1$ , ring A and ring B are 1,4-phenylene groups, La and Lb are single bonds, and ring C is said general formula (IIa), then at least one of  $X^1$ ,  $X^2$  and  $X^3$  represents a fluorine atom;

in a case in which Z is a cyano group, R is an unsubstituted and saturated alkyl group or alkoxyl group,  $n^a = n^b = n^c = 0$  and  $n^d = 1$ , or  $n^a = n^b = n^d = 0$  and  $n^c = 1$ , ring C and ring D are 1,4-phenylene groups, Lc and Ld are single bonds or -COO- linkages, and ring C is said general formula (IIa), then at least one of  $X^1$ ,  $X^2$  and  $X^3$  represents a fluorine atom;

in a case in which Z is a cyano group, R is an unsubstituted and saturated alkyl group or alkoxyl group,  $n^a = n^b = n^c = 0$  and  $n^d = 1$ , or  $n^a = n^b = n^d = 0$  and  $n^c = 1$ , ring C and ring D are 1,4-phenylene groups, Lc and Ld are single bonds or -COO- linkages, and ring C is said general formula (IIb), then at least one of  $X^4$ ,  $X^5$  and  $X^6$  represents a fluorine atom;

in a case in which Z is a fluorine atom, R is an unsubstituted and saturated alkyl group or alkoxyl group,  $n^a = n^b = n^c = 0$  and  $n^d = 1$ , or  $n^a = n^b = n^d = 0$  and  $n^c = 1$ , ring C and ring D are 1,4-phenylene groups, Lc and Ld are -COO- linkages, and ring C is said general formula (IIb), then at least one of  $X^4$ ,  $X^5$  and  $X^6$  represents a fluorine atom;

and in a case in which ring C is said general formula (IIb), at least one of  $n^c$  and  $n^d$  is

1).

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2. A tetrahydronaphthalene derivative according to claim 1, wherein in said general formula (I), ring C is represented by said formula (IIa).

3. A tetrahydronaphthalene derivative according to claim 1, wherein in said general  
5 formula (I), ring C is represented by said formula (IIb).

4. A tetrahydronaphthalene derivative according to any one of claims 1 through 3,  
wherein in said general formula (I), either one of  $n^a$  and  $n^b$  is 0.

10 5. A tetrahydronaphthalene derivative according to any one of claims 1 through 4,  
wherein in said general formula (I), either one of  $n^c$  and  $n^d$  is 0.

6. A tetrahydronaphthalene derivative according to any one of claims 1 through 5,  
wherein in said general formula (I),  $n^a = n^b \neq 0$ .

15 7. A tetrahydronaphthalene derivative according to any one of claims 1, 2, 4 and 5,  
wherein in said general formula (I),  $n^c = n^d = 0$ .

8. A tetrahydronaphthalene derivative according to any one of claims 1 through 7,  
20 wherein in said general formula (I), at least one of  $n^a$ ,  $n^b$ ,  $n^c$  and  $n^d$  is 1.

9. A tetrahydronaphthalene derivative according to any one of claims 1 through 8,  
wherein in said general formula (I), said linkage groups La, Lb, Lc and Ld are each selected  
independently from a group consisting of a single bond,  $-\text{CH}_2\text{CH}_2-$ , and  $-\text{C}\equiv\text{C}-$ .

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10. A tetrahydronaphthalene derivative according to any one of claims 1 through 9, wherein in said general formula (I), said linkage groups La, Lb, Lc and Ld are each selected independently from a group consisting of a single bond and  $-\text{CH}_2\text{CH}_2-$ .

5

11. A tetrahydronaphthalene derivative according to any one of claims 1 through 10, wherein in said general formula (I), said linkage groups La, Lb, Lc and Ld are each a single bond.

10

12. A tetrahydronaphthalene derivative according to any one of claims 1 through 11, wherein in said general formula (I), ring A, ring B and ring D are each independently selected from a group consisting of a trans-1,4-cyclohexylene group, a trans-decahydronaphthalene-2,6-diyl group, a trans-1,3-dioxane-2,4-diyl group, a 1,4-phenylene group which may be substituted with one or two fluorine atoms, and a naphthalene-2,6-diyl group which may be substituted with one or two fluorine atoms.

15

13. A tetrahydronaphthalene derivative according to any one of claims 1 through 12, wherein in said general formula (I), Z is a fluorine atom.

20

14. A tetrahydronaphthalene derivative according to any one of claims 1 through 12, wherein in said general formula (I), Z is a cyano group.

15. A tetrahydronaphthalene derivative according to any one of claims 1 through 12, wherein in said general formula (I), Z is a trifluoromethoxy group.

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16. A tetrahydronaphthalene derivative according to any one of claims 1 through 15,  
wherein in said general formula (I), R is a saturated or unsaturated alkyl group of 1 to 20  
carbon atoms which may incorporate a branched chain and may be substituted with 1 to 7  
5 fluorine atoms or alkoxyl groups of 1 to 7 carbon atoms.

17. A tetrahydronaphthalene derivative according to any one of claims 1 through 16,  
wherein in said general formula (I), R is a saturated or unsaturated straight chain alkyl group  
of 1 to 20 carbon atoms.

18. A tetrahydronaphthalene derivative according to any one of claims 1 through 17,  
wherein in said general formula (I),  $X^3$ ,  $X^4$  and  $X^5$  in said formula (IIa) and said formula (IIb)  
are hydrogen atoms.

19. A tetrahydronaphthalene derivative according to any one of claims 1 through 18,  
wherein in said general formula (I),  $X^2$  in said formula (IIa) is a hydrogen atom and  $X^1$  is a  
fluorine atom.

20. A tetrahydronaphthalene derivative according to any one of claims 1 through 18,  
wherein in said general formula (I),  $X^1$  in said formula (IIa) is a hydrogen atom and  $X^2$  is a  
fluorine atom.

21. A tetrahydronaphthalene derivative according to any one of claims 1 through 20  
which shows liquid crystallinity.

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22. A tetrahydronaphthalene derivative according to any one of claims 1 through 21 which shows a nematic phase.

5 23. A tetrahydronaphthalene derivative according to any one of claims 1 through 22 which upon addition to a nematic liquid crystal composition shows a nematic phase.

24. A liquid crystal composition containing at least one compound of said general formula (I) according to any one of claims 1 through 23.

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25. A liquid crystal composition according to claim 24 which can be used for active matrix driving.

26. A liquid crystal element comprising a liquid crystal composition according to claim

15 25 as a structural element.

27. An active matrix driven liquid crystal display element utilizing a liquid crystal composition according to claim 26.